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(56) Documents Cited

EP 0632413 A1 EP 0564832 A1 EP 0432409 A1  
EP 0147837 A2 WO 96/18139 A1 US 4333090 A

(58) Field of Search

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(54) Graphical password entry

(57) A log-in procedure to a computer system for users of a data terminal, which procedure serves with the aid of a graphical password entry to render it more difficult to decode the password. For this purpose the computer displays on the display screen a number of graphical symbols which e.g must be clicked using the mouse pointer. The positions of the graphical symbols can be changed on the display screen from one log-in procedure to another.



Fig. 1

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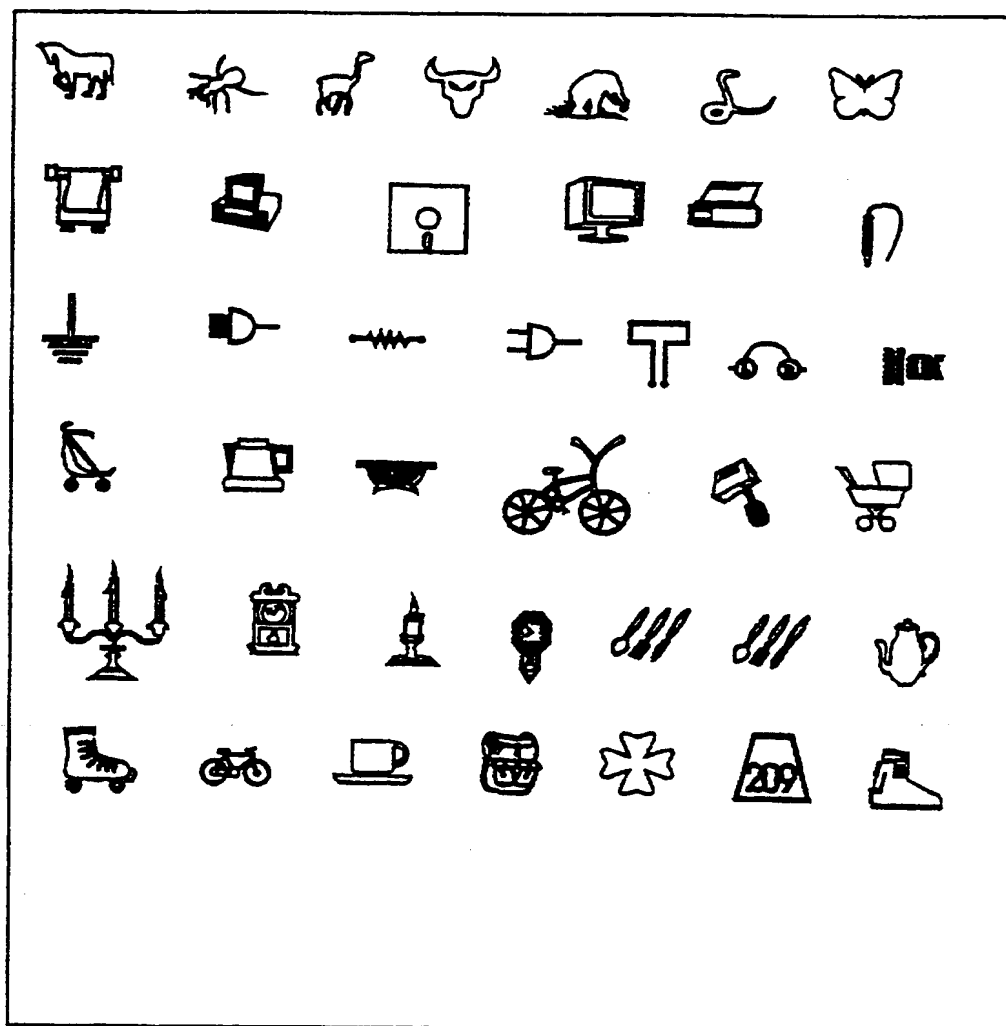


Fig. 1

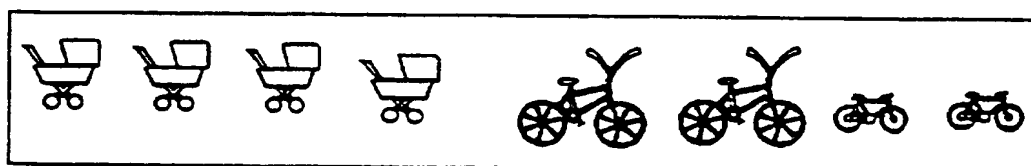


Fig.2

DESCRIPTIONGRAPHICAL PASSWORD ENTRY

The invention relates to a log-in procedure to a computer system with the aid of inputting a graphical password.

The log-in procedure to a computer system normally requires the user name and a user-specific password to be input by way of a keyboard. However, this password protection is not sufficient. In practice, passwords can be decoded in a short space of time with the aid of password generators. The reason for this is the human brain which is only able to recall well structured sequences, that is to say words which have a meaning. When the contents of the lexicons of different languages are examined, it is probable that the password will be decoded. In practice, password interrogation is the only hurdle to accessing a modern computer network. It is absolutely necessary to provide a reliable password interrogation for the purpose of protecting the system. Consequently it is naturally not permitted to note down the password anywhere and it must nevertheless comprise a simple structure such that it can be used again even after a long period. The system security sets a prerequisite that the ideal password however is to be an arbitrary combination of letters and / or numbers. However, it is precisely this type of sequence which a human being is unable to retain in his / her memory.

A type of password entry is known wherein alphanumeric characters are displayed on a display screen. The actual password is achieved using a mouse by clicking on to the alphanumeric character in the correct sequence. In the case of this system it is, however, still possible for an unauthorized user to decode the

password by observing the activity on the display screen.

In accordance with the present invention, there is provided a log-in procedure to a computer system for users of a data terminal, of the type in which the password is entered by selecting a graphical symbol in a position on the display screen, wherein the graphical symbols of the display screen are generated by the computer in any of the display screen positions, which positions change from one log-in procedure to another, and wherein the symbols are fixedly allocated to a code stored in the computer and a fixed series of symbols in its entirety represents the password.

In contrast to the prior art, a log-in procedure in accordance with the present invention has the advantage that the symbols which are displayed on the display screen change position from one log-in procedure to the next. This has the advantage that an unauthorized user is not able to decode the password by observing the log-in procedure.

By virtue of the features set down in the subordinate claims it is possible to develop further and improve the log-in procedure stated in the main claim.

It is a further advantage that the computer system can allocate to the display screen positions code sequences of any length. It is particularly advantageous that the password is not bound to alphanumeric characters, but rather that graphical images can be displayed so that the system functions independently of the language area. It is also possible with this log-in procedure to illustrate Chinese or Japanese characters or even to illustrate a graphics picture which is particularly suitable for children. A further advantage is that it is possible to render it more difficult for others to read the password sequence

simultaneously, in that the actual clicking on to the desired symbol is disguised by virtue of the fact that clicking noises produced by the computer are superimposed. The length of the password, i.e the number of graphical symbols clicked is fixed by the system. It is possible for these code sequences, which are allocated to these graphical symbols or to their positions on the display screen, to be of any length.

In an advantageous embodiment a picture illustration, and not individual graphical symbols, is projected on to the display screen.

An exemplified embodiment of the invention is explained in detail in the description hereinunder and illustrated in the drawing, in which

Figure 1 shows a display screen for the graphical password entry,

Figure 2 shows a sequence of correct graphical symbols.

The log-in procedure to a computer system is commenced by entering a user name at a data terminal. The system projects on the display screen of the terminal a two-dimensional arrangement of windows, in which symbols, images or even alphanumeric characters are located. The system requests the user to enter his / her password. Depending upon the resolution and size of the display screen, the image which is displayed on the screen can contain up to 100 different symbols, wherein the prerequisite is that the images can be readily identified and comprise sufficient distinctive features. For example the graphical password consists of a row of eight symbols, which during input must be selected in a specific order by the user. The symbols are selected e.g by clicking on to the said symbols using a mouse. When using touch screens the symbol is selected by touching the screen. When selecting a symbol only one click tone is transmitted

as an acknowledgement and the current number of symbols selected is indicated. In so doing the actual graphical window containing the symbols does not change. It is merely the xy-positions of the mouse click which are transmitted by way of the connection line between the data terminal and the computer. It is only in the computer itself that the position is allocated to the associated identification by way of a table [sic]. This identification forms the actual password, which is checked in the conventional manner in the computer, e.g the number of unsuccessful attempts, or a blocking of the password entry after three unsuccessful attempts can be fixed. By virtue of the fact that the password sequence is fixed merely by the xy-data and is transmitted by way of the line, it is also no longer possible to decode the password by monitoring the data transfer line.

If the user would like to log-in to the computer system on another occasion, the user is again provided with a display screen containing graphical symbols. The number of symbols is maintained, however these symbols are arranged by the computer in a different sequence on the display screen. If the positions are changed from log-in procedure to log-in procedure, a list of the symbols, the xy-positions and the identifications must also be changed in each case. A possible password entry is illustrated in Figure 2, wherein in this example no different symbols have been selected. In this case the password sequence consists of eight symbols, namely 4 "prams", 2 "child bicycles" and 2 "bicycles". A password sequence of this type can be more readily retained in the human brain, as it is possible to relate a story to the series of images. Moreover, the human brain is better able to recall images than alphanumeric characters. A possible password must be able to be fixed by the user, so that the advantages of storing graphics

in the brain can be utilized.

The selection when fixing the password sequence occurs likewise by clicking on to the possible symbols which are all displayed on the display screen. A click tone is produced as an acknowledgement to clicking on to a symbol and the current selection of the selected symbols is indicated.

A further protective feature can be incorporated for the log-in procedure to computer systems. In the case of this protective feature, in addition to the click tone when clicking on to the correct symbol, the system actually produces a series of tones, which are superimposed onto the actual log-in procedure. In this manner it is also made more difficult to deduce the positions of the graphical symbols by overhearing.

CLAIMS

1. A log-in procedure to a computer system for users of a data terminal, of the type in which the password is entered by selecting a graphical symbol in a position on the display screen, wherein the graphical symbols of the display screen are generated by the computer in any of the display screen positions, which positions change from one log-in procedure to another, and wherein the symbols are fixedly allocated to a code stored in the computer and a fixed series of symbols in its entirety represents the password.

2. A log-in procedure according to claim 1, wherein the position of the symbol selected is transmitted from the data terminal to the computer.

3. A log-in procedure according to claim 1 or 2, wherein the identification, stored in the computer, with respect to one position and thus to the symbol can contain any number of alphanumeric characters.

4. A log-in procedure according to claim 1 or 2, wherein it is possible to determine the number of symbols which represent a password.

5. A log-in procedure according to any of claims 1 to 4, wherein the symbols are selected by touching a touch-screen.

6. A log-in procedure according to any of claims 1 to 5, wherein a click tone is produced as an acknowledgement of clicking on to a symbol and there is a large number of symbols.

7. A log-in procedure according to any of claims 1 to 6, wherein the symbols can consist of alphanumeric characters or of images.

8. A log-in procedure according to any of claims 1 to 7, wherein the system produces click tones which are superimposed on to the actual clicking of the





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**Patents Act 1977**  
**Search Report under Section 17**

**Databases searched:**

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): G4H (HKK,HTG), G4A (AAP)

Int Cl (Ed.6): G06F, G07C

Other:

**Documents considered to be relevant:**

Category	Identity of document and relevant passage	Relevant to claims
X	EP 0632413 A1 (BULL CP8)	1 at least
X	EP 0564832 A1 (IBM)	"
X	EP 0432409 A1 (KROMER)	"
X	EP 0147837 A2 (OMRON TATEISI)	"
X,P	WO 96/18139 A1 (PHILIPS)	"
X	US 4333090 (HIRSCH)	"

X Document indicating lack of novelty or inventive step  
Y Document indicating lack of inventive step if combined with one or more other documents of same category.  
& Member of the same patent family

A Document indicating technological background and/or state of the art.  
P Document published on or after the declared priority date but before the filing date of this invention.  
E Patent document published on or after, but with priority date earlier than, the filing date of this application.

symbols.

9. A log-in procedure to a computer system, substantially as hereinbefore described, with reference to and as illustrated in the accompanying drawings.

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